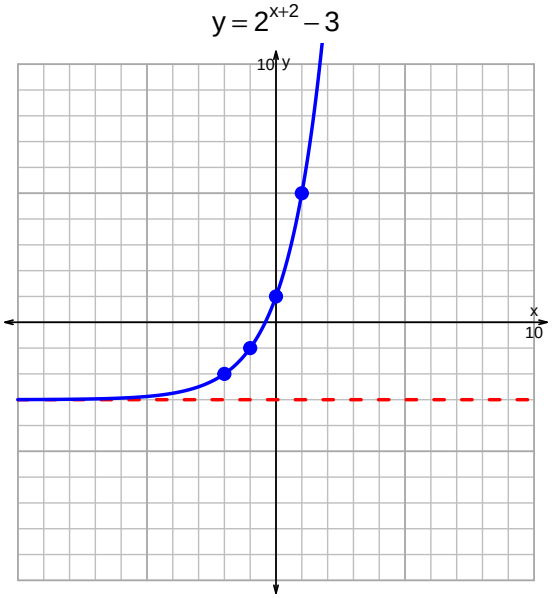
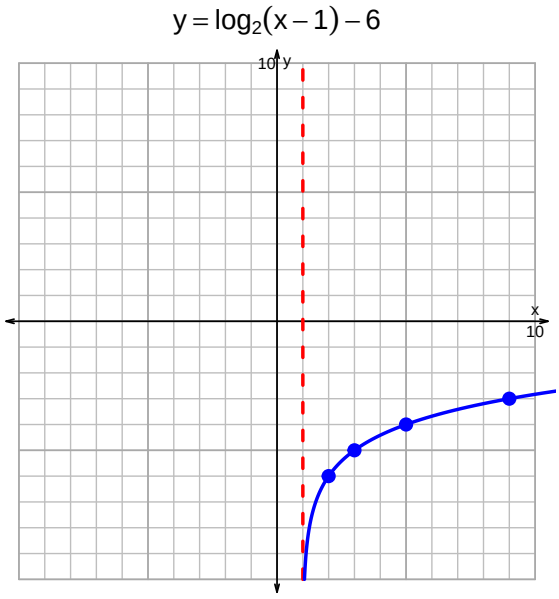
Name: Date:

s18: EXP LOG (SLTN v346)

1. (10 pts) Graph $y = 2^{x+2} - 3$ and $y = \log_2(x-1) - 6$ on the grids below. Also, draw any asymptotes with dashed lines.





Somewhat useful hint: $2^3 = 8$, *and thus* $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$13 = \left(\frac{3}{4}\right) \cdot 10^{5t/7}$$

Divide both sides by $\frac{3}{4}$.

$$\frac{13 \cdot 4}{3} = 10^{5t/7}$$

Take log, base 10, of both sides.

$$\log_{10}\left(\frac{13 \cdot 4}{3}\right) = \frac{5t}{7}$$

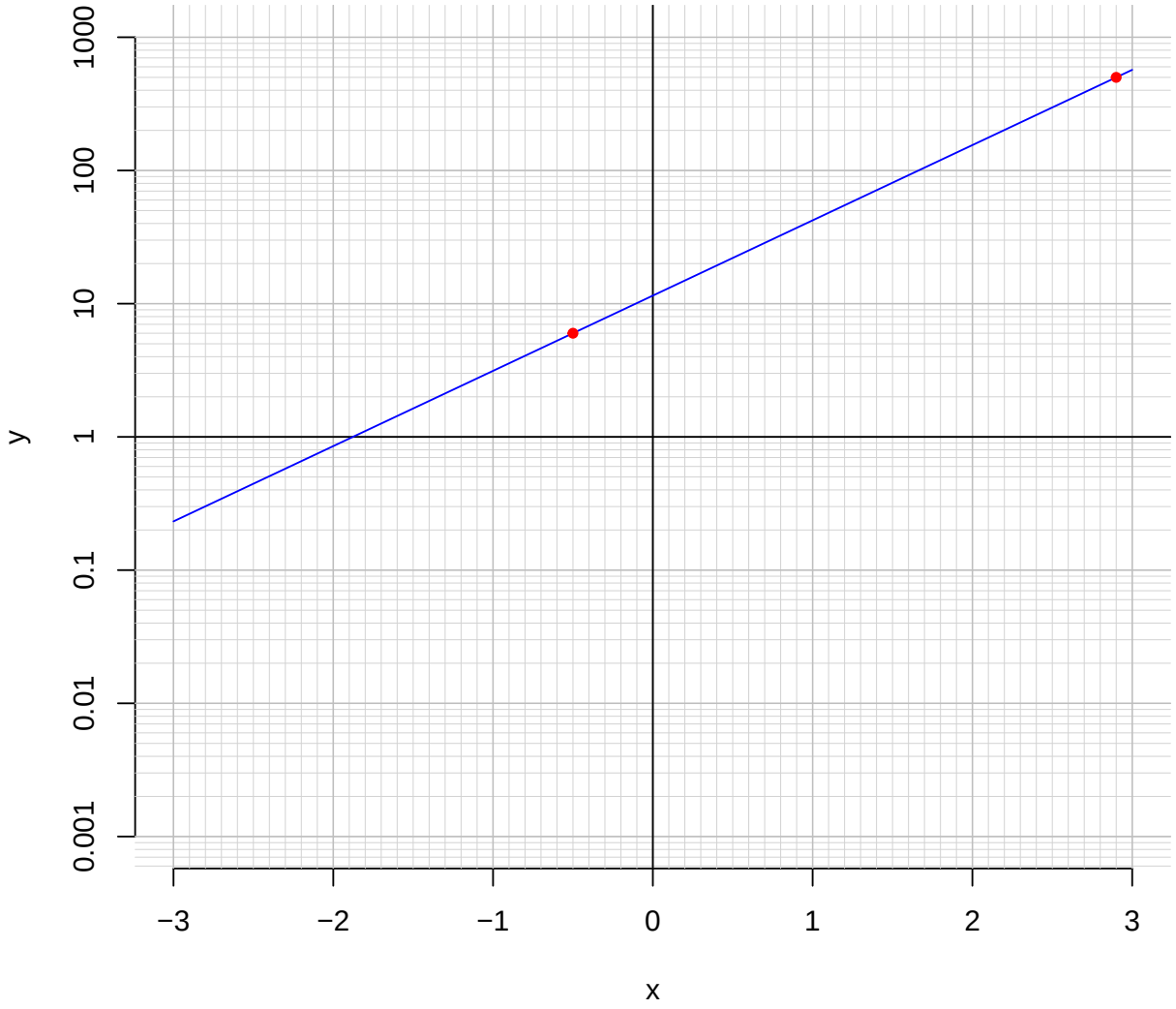
Divide both sides by $\frac{5}{7}$.

$$\frac{7}{5} \cdot \log_{10}\left(\frac{13 \cdot 4}{3}\right) = t$$

Switch sides.

$$t = \frac{7}{5} \cdot \log_{10}\left(\frac{13 \cdot 4}{3}\right)$$

3. (10 pts) An exponential function $f(x) = 11.5 \cdot e^{1.3x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(-0.5)$.

$$f(-0.5) = 6$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{1}{1.3} \cdot \ln\left(\frac{x}{11.5}\right)$$

Using the plot above, evaluate $f^{-1}(500)$.

$$f^{-1}(500) = 2.9$$